What is claimed is:

1. A system for recognizing motion information of an object based on the images of said object, comprising:

an imager for taking time-series images of an moving object;

image capture means for capturing said time-series images of said object to generate image vectors;

a primary component analyzer for obtaining, through principal component analysis, a plurality of eigenvectors of the image vectors of a sample object which are generated by said image capture means;

a storage for storing said plurality of eigenvectors;

inner product means for performing inner product operations between the image vectors of a recognized object which are generated by said image capture means and said plurality of eigenvectors stored in said storage means; and

calculation means for obtaining the motion information of said recognized object based on the result of said inner product operations.

2. The motion information recognition system as claimed in claim 1, wherein said image vectors of said sample object and said image vectors of said recognized object are generated from at least two images which are successive in terms of time.

3. The motion information recognition system as claimed in claim 1, further comprising selection means for selecting the largest eigenvalue for a first eigenvector and the second largest eigenvalue for a second eigenvector.

4. The motion information recognition system as claimed in claim 3, wherein said calculation means, based on the phase of the result $g_1(t)$ of the inner

product operations between said image vectors of said recognized object and said first eigenvector, and the phase of the result $g_2(t)$ of the inner product operations between said image vectors of said recognized object and said second eigenvector, obtains an angular speed of said recognized object according to the following equation (a) when said $g_1(t)$ is delayed in phase relative to said $g_2(t)$:

(a) $\omega = \frac{d}{dt} g_1(t)/g_2(t)$;

and obtains an angular speed of said recognized object according to the following equation (b) when said $g_1(t)$ is advanced in phase relative to said $g_2(t)$:

(b) $\omega = \frac{d}{dt} g_2(t)/g_1(t)$.

5. A computer program executable on a computer for recognizing the motion information of an object based on the images of said object, being configured to:

take time-series images of an moving object;

generate learned image vectors from said time-series images of said object;

obtain, through principal component analysis, a plurality of eigenvectors of the learned image vectors;

store said plurality of eigenvectors;

perform inner product operations between the image vectors of a recognized object and said plurality of eigenvectors stored in said storage means; and

obtain the motion information of said recognized object based on the result of said inner product operations.

6. The program as claimed in claim 1, being further configured to generate

said image vectors of said sample object and said image vectors of said recognized object from at least two images which are successive in terms of time.

7. The program as claimed in claim 1, being further configured to select the largest eigenvalue for a first eigenvector and the second largest eigenvalue for a second eigenvector.

8. The program as claimed in claim 3, being further configured to, based on the phase of the result of the inner product operations between said image vectors of said recognized object and said first eigenvector and the result of the inner product operations between said image vectors of said recognized object and said second eigenvector;

obtain an angular speed of said recognized object according to the following equation (a) when said result for the first eigenvector is delayed in phase relatively to the result for the second eigenvector:

(a) $\omega = \frac{d}{dt} g_1(t)/g_2(t)$; and

obtain an angular speed of said recognized object according to the following equation (b) when said result for the first eigenvector is advanced in phase relatively to the result for the second eigenvector:

(b) $\omega = \frac{d}{dt} g_2(t)/g_1(t)$.

9. A method for recognizing the motion information of an object based on the images of said object, comprising:

taking time-series images of an moving object;

generating learned image vectors from said time-series images of said object;

obtaining, through principal component analysis, a plurality of eigenvectors of the learned image vectors;

storing said plurality of eigenvectors;

performing inner product operations between the image vectors of a recognized object and said plurality of eigenvectors stored in said storage means; and

obtaining the motion information of said recognized object based on the result of said inner product operations.

10. The method as claimed in claim 1, further comprising generating said image vectors of said sample object and said image vectors of said recognized object from at least two images which are successive in terms of time.

11. The method as claimed in claim 1, further comprising selectingthe largest eigenvalue for a first eigenvector and the second largest eigenvalue for a second eigenvector.

12. The program as claimed in claim 3, further comprising, based on the phase of the result of the inner product operations between said image vectors of said recognized object and said first eigenvector and the result of the inner product operations between said image vectors of said recognized object and said second eigenvector;

obtaining an angular speed of said recognized object according to the following equation (a) when said result for the first eigenvector is delayed in phase relatively to the result for the second eigenvector:

(a) $\omega = \frac{d}{dt} g_1(t) / g_2(t)$; and

obtaining an angular speed of said recognized object according to the following equation (b) when said result for the first eigenvector is advanced in

phase relatively to the result for the second eigenvector:

(b) $\omega = \frac{d}{dt} g_2(t)/g_1(t)$.